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The European union's 2010 target: Putting rare species in focus

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ABSTRACT

The European Union has adopted the ambitious target of halting the loss of biodiversity by 2010. Several indicators have been proposed to assess progress towards the 2010 target, two of them addressing directly the issue of species decline. In Europe, the Fauna Europaea database gives an insight into the patterns of distribution of a total dataset of 130,000 terrestrial and freshwater species without taxonomic bias, and provide a unique opportunity to assess the feasibility of the 2010 target. It shows that the vast majority of European species are rare, in the sense that they have a restricted range. Considering this, the paper discusses whether the 2010 target indicators really cover the species most at risk of extinction. The analysis of a list of 62 globally extinct European taxa shows that most contemporary extinctions have affected narrow-range taxa or taxa with strict ecological requirements. Indeed, most European species listed as threatened in the IUCN Red List are narrow-range species. Conversely, there are as many wide-range species as narrow-range endemics in the list of protected species in Europe (Bird and Habitat Directives). The subset of biodiversity captured by the 2010 target indicators should be representative of the whole

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biodiversity in terms of patterns of distribution and abundance. Indicators should not overlook a core characteristic of biodiversity, i.e. the large number of narrow-range species and their intrinsic vulnerability. With ill-selected indicator species, the extinction of narrow-range endemics would go unnoticed.

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1. Introduction

The European Union has adopted the ambitious target of halting the loss of biodiversity by 2010 (European Union, 2001). It exceeds the target chosen by the nations of the world at the 2002 World Summit on Sustainable Development, which was to “achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on earth” (Convention on Biological Diversity, 2001a). In order to assess progress towards these targets, biodiversity should be monitored to know whether the rate of loss is increasing or decreasing, and eight indicators for immediate testing in seven focal areas were proposed by the CBD’s seventh Conference of the Parties (COP7). In the focal area on “status and trends of the components of biological diversity” three indicators were proposed to assess progress towards the 2010 target (Convention on Biological Diversity, 2001b):

- Trends in extent of selected biomes, ecosystems and habitats.
- Trends in abundance and distribution of selected species.
- Coverage of protected areas.

In the same focal area, two other possible indicators are in development

- Change in status of threatened species.
- Trends in genetic diversity of domesticated animals, cultivated plants, and fish species of major socioeconomic importance.

Theoretically, these indicators provide a powerful way to assess progress. However, they could be difficult to implement, as data or standardized methodologies are lacking: even the assessment of the coverage of protected areas is hindered by the fact that protected areas do not have the same definitions in every country, and are sometimes difficult to attribute to IUCN Protected Area Management Categories (IUCN, 1994). Only two of these indicators are directly linked to species loss, being species-based, “Trends in abundance and distribution of selected species” and “Change in status of threatened species”. Butchart et al. (2004) presented a method for producing indices based on the IUCN Red List to assess projected relative extinction risk of a species, and tested it for the world’s birds and amphibians (Butchart et al., 2005). That was a major contribution to the development of the Red List indicator, which will measure changes in overall extinction risks for all species in taxa for which Red List data are available. However, at a global scale, only 0.1% of insect species, 3.1% of mollusc species and 1.3% of

crustacean species have been evaluated, vs. 100% of bird species, 100% of amphibian species and 89.7% of mammal species (IUCN, 2006). Obviously, data are lacking for the assessment of whole invertebrate groups, as most invertebrate species have not been compared with the threat criteria: the Red List indicator, though powerful, is useless for species that have not been checked against the Red List criteria, i.e. most invertebrates, but also 91.9% of reptile species and 90.1% of fish species (IUCN, 2006). A number of groups are currently being assessed against the Red List (reptiles, freshwater fish, sharks, rays and chimeras and freshwater molluscs), and will be used to build a more robust aggregated Red List indicator (Butchart et al., 2005). However, this will still not cover most invertebrates, which represent the bulk of biodiversity, and one can ask whether this will even capture the main characteristics of biodiversity. Similarly, the “selected species” chosen for the indicator “Trends in abundance and distribution of selected species” should be representative of overall biodiversity, and not only of the better known species. Taking into account the neglected invertebrates in conservation policies is not only important for its own sake, but also because these species affect ecosystem functioning, although our knowledge of the linkages between biodiversity and ecosystem processes is very incomplete. Loss of biodiversity makes ecosystems vulnerable, and this may be particularly true for the neglected invertebrate taxa which, despite their minute size, play an important role in ecosystem functioning (Palmer et al., 1997; Tilman et al., 1997).

Although not directly correlated with vulnerability, rarity is a major determinant of a species’ likelihood of extinction (Gaston, 1994; Yu and Dobson, 2000) and species usually become rare before going extinct (Dobson et al., 1995). There have been many attempts to recognize various forms of rarity (see Gaston (1994) for a compilation), but the most well-known is Rabinowitz (1981). In this model, three factors can be combined to assess a species’ rarity: range size (distribution), population size (demography) and habitat requirements (ecology). Species demonstrating geographical rarity are narrow-range endemics; species demonstrating demographic rarity are typically represented by large predators and species in decline; ecologically rare species are specialist species, the extreme case being single host parasitic species. The combination of these factors produces eight forms of rarity, the ninth group (large range, large population size and broad habitat requirements) being common species.

In the light of these theoretical considerations on rarity, we have assessed the reliability of the CBD 2010 target indicators at the scale of the European fauna, on the basis of the Fauna Europaea dataset. The Fauna Europaea program, funded by the European Commission for a period of 4 years (1 March 2000–1 March 2004) within the Fifth Framework